MARINE REVIEW.

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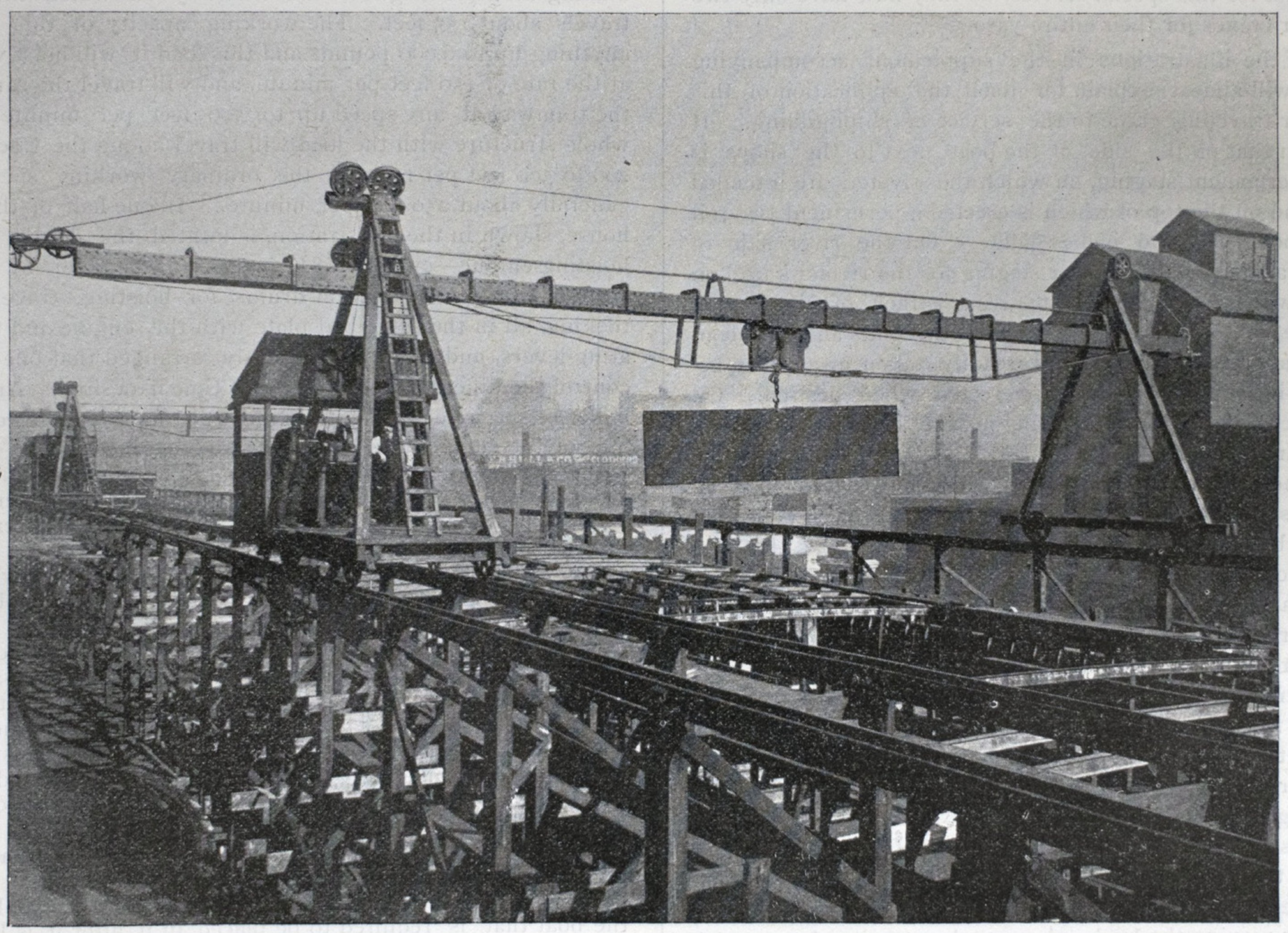
Novel and Improved Types of Shipbuilding Cranes.

IN 1887 when the Cleveland Ship Building Company first started its present shipyard, the president, Mr. Henry D. Coffinberry, was not satisfied to handle material for building ships in any of the old and expensive ways, that is, by means of a large force of men whose duty is solely to drag and pull plates, frames, etc., from the machine shops to the different parts of the ships being built. By this old method many of these plates required to be blocked and wedged up against the bottom of the boat in various temporary ways and then held in position until they were riveted, or, if the plates were intended for the sides of a ship, a temporary derrick, or gin-pole, had to be raised at the place where the plates were to be placed and the plates then lifted and held until riveted, and then this temporary derrick had to be taken down and moved to a different place where other plates were required. This common, old process required for each boat being built, from fifty to one hundred men, at this kind of labor, to supply the riveters with material and the speed with which a boat could be built was determined more by the number of men that were employed in handling material in this way, than by the capacity of the shop, or by the capacity of the men to put together the material on the ship itself. As before stated, the Cleveland Ship Building Company desired something better than this and believed that a decided improvement could be made by substituting for this large amount of labor machinery that would do the work, and which could be operated by but few men. With this object in view they called upon Mr. Alex. E. Brown, vice-president and manager of the Brown Hoisting and Conveying Machine Company, of Cleveland, Ohio, U. S. A., to examine their shipyard and all of its requirements and construct



BROWN PATENT TRAVELING CRANE APPLIED TO THE SHIP YARD OF THE CLEVELAND SHIP BUILDING CO.

for them an appliance deemed best suited to their special case. On account of the close proximity of the shops of the Cleveland Ship Building Company to the vessels being constructed, it did not seem to require an appliance operated by steam power, so the problem was reduced to one of hand power. The Brown Hoisting and Conveying Machine Company contracted to put up, after the general design of one of their patented systems, a hand power traveling crane arranged for this particular work, expecting that if this first crane operated to the satisfaction of the ship building company, there would be needed for each vessel length at least three cranes to handle the material rapidly enough by hand power. The first patent hand power traveling crane was put into use about Oct. 26, 1887, and it was guaranteed that with it two men could hoist a load of 1,000 pounds, vertically, at the

rate of ten feet per minute, travel said load across the bridge at rate of fifty to seventy-five feet per minute and move the entire traveling crane with its load lengthwise of the vessel at the rate of fifty feet per minute. The crane was tested and it was found that two men lifted 2,000 pounds, fifteen feet per minute and could travel the trolley across the bridge 150 to 250 feet per minute, and move the entire crane with load along the tramway at the rate of 80 to 120 feet per minute. This heretofore unprecedented efficiency in a hand power crane was an astonishment to the ship building company as well as a great satisfaction to the builders of the crane and the continuous result of this high efficiency can be comprehended by the fact that this single crane with two men handled all the material used in the construction of two of the largest type of lake boats building at the time. The Cleveland Ship Building Company instead of ordering five more as they fully expected would be required for this service, continued to use but this single crane until a boat was contracted for of wider beam than the span of this first crane would accommodate, when a second crane was erected of longer span than the first for this special service, so they now have only two hand power cranes for their entire yard.

One of the illustrations in the supplement accompanying this paper will almost explain for itself the application of this hand power traveling crane to the service of shipbuilding. It will be seen that on the side of the boat next to the shops is erected a permanent staging, on which the riveters are intended to work, and on the top of which is erected a permanent two-rail track of about 5 feet 6 inches gauge. On the river side of the boat is a somewhat narrower staging for the riveter's use, on the top of which is a stringer supporting a track of single rail. This trestle, or staging, is put together with bolts and is so constructed that it can be easily and readily taken away just before launching a boat and again re-erected when desired. On the two tracks on the top of the staging the hand power crane, as shown in the illustration, travels the entire length of the yard. When the front staging is to be taken down for launching a boat sideways into the river, the hand power crane is simply moved beyond either the bow or stern of the boat, that portion of the crane tracks not being required to be disturbed while launching a boat. The cantilever extension of the beam of the crane towards the shops, projects over the platform in front of the same, from which the plates and material are taken to be placed in the boat. The length of the bridge of this traveling crane is 67 feet and the span between the supports is adjustable from 46 feet to 53 feet. It is made adjustable so that the staging on the river side may be brought to the proper distance from the vessel being constructed, according to the with or beam of same. The crane's ordinary working capacity is 3,000 pounds, but loads as great as two and a half tons have been handled with it. There are four speeds for hoisting, four of traveling across the bridge, and two for moving the load and crane along the tracks on which it is mounted The officers of the Cleveland Ship Building Company can not speak too highly of these cranes. They say the cranes have saved them an enormous amont of time and labor in the building of vessels. The cost of operating them has been only the wages of the two men to each crane, and the repairs for the past three years have amouted to practically nothing.

The reputation of these first two patent hand power cranes at this yard spread among the different ship building concerns throughout the country and it was not long before the Brown Hoisting and Conveying Machine Company was called upon to design a steam power apparatus, suited to the requirements of the shipyard of F. W. Wheeler & Co., at West Bay City, Mich. Two other views shown in connection with this article clearly state the manner in which this problem was solved. It will be seen that the shops are arranged parallel to the vessels being built, but about 100 feet away from the staging. It was therefore necessary to span this space with the crane and also to make a cantilever extension over the vessel long enough to carry the plates to the river side of the largest and widest boats. In this case there are no outer supports required for the crane, as in the case of the hand power crane at the yard of the Cleveland Ship Building Company, the permanent staging on the shore end of the vessel forming a trestle and a base on which the track for the engine house and pier for the crane is mounted. The inner end of this bridge tramway is supported on a single pier or shear and close in against the side of the shops and on an elevated single rail track. This arrangement, as will be seen, leaves the yard clear of all obstructions and over its entire surface may be stored all the material required for the building of ships. The crane, by means of the trolley on its tramway picking up the load at any point in the yard, travels through or between the engine house and boiler house and out onto the cantilever extension over the vessel, lowers and places the plates wherever desired. The clear span of this structure between supports is 100 feet and the cantilever projection over the vessel is 55 feet, making the total length of the tramway on which the trolley travels about 155 feet. The working capacity of this crane is anything up to 6,000 pounds and this load it will hoist vertically at the rate of 150 feet per minute, and will travel the same along the tramway at any speed up to 500 feet per minute and the whole structure with the load will travel along the tracks from 200 to 300 feet per minute, the ordinary working speed being generally about 250 feet per minute. In one-half of the engine house, shown in the illustration, is located the double cylinder hoisting engine—cylinders 8½ inches in diameter by 12 inch stroke—with patent friction drums for hoisting, traveling and rocking, all in the same bed plate with the engine and the operating levers, and all so conveniently arranged that one man can control the different motions at one time if desired. An upright boiler of special design with submerged flues is located in the half of the engine house opposite the engine and is provided with a large water tank and coal bin. The efficiency of, and the economy realized by the use of this crane has been very great. F. W. Wheeler & Co. state that the working of this crane has been exceedingly satisfactory and that they conld not well get along without it. The saving in time and labor, they say, has been so great that the crane more than paid for itself in six months' use.

One of the representatives of this journal visited the yards of the Chicago Ship Building Company a few days ago, and saw in operation there still another design of travelling crane adapted to the building of ships, designed and patented (as in all the other cases), by Mr. Alex. E. Brown, and built by The Brown Hoisting and Conveying Machine Company. This crane is arranged to serve two boats, and is operated, like the crane at the yard of F. W. Wheeler & Co., by steam power. It is built for a working capacity of from 6,000 pounds to 20,000 pounds, so that besides the plates of the ship itself, any piece of its machinery can also be put in place before launching. The boiler is the only part of the boat that is required to be placed in it after it is launched. This crane is of the patent balanced cantilever type with a span of 110 feet.

The builders of these cranes have also contracted with the Newport News Ship Building & Dry Dock Company, Newport News, Va., for two cranes, one of 130 feet span, to be used for the handling of plates for two vessels, and the other of 120 feet span to be used in the yard of the company as a locomotive crane, for the handling of material in and around the yard and between buildings. The capacity of this crane is also from 6,000 to 20,000 pounds. The traveling speed along the tramway is from 200 feet to 300 feet per minute, and the 20,000 pounds can be hoisted 50 feet per minute. The design and workmanship of these cranes is of the very highest order and it must be only a matter of time when all the ship yards in the country will be required through the necessity of economy to use them. It will be seen from the foregoing that the speed with which heavy loads are handled by these traveling cranes is much greater than any ever before attained, while the efficiency and economy of the cranes and hoists manufactured are unrivalled, and have already attained a wide reputation.

Grand Lodge of the E. M. B. A.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., Jan. 8.—The first convention of the Excelsior Marine Benevolent Association opened Tuesday morning under favorable auspices. The out of town delegates were agreeably surprised over the commodius and handsomely furnished rooms of the parent association. The following named delegates wers present:

Buffalo—Alexander Clark, J. M. Todd, Edward Thorpe, Walter Robinson, A. J. Mc onald, Thomas Collins, Lyman Hunt, J. H. Dissett, M. Niland, F. D. Welcome, William Dickson, John Perew.

Port Huron branch, No. 1.—Jo n Ivers, W. A. Ashley. Two other delegates were selected, but they did not come.

Chicogo branch, No. 2.—James Hogan, James Comstock, J. O. Woods, G. W. Pardee.

Cleveland branch, No. 3.—Edward Kelley, W. A. Collier, A. J. Cowley, J. A. Holmes, John Nelson, J. B. Hall, H. W. Stone, G. B. Mallory, W. S. Mack, Thomas Jones.

Bay City branch, No. 4.—J. McNeill, D. Pierce.

Alexander Clark, president of the Buffalo association, was chosen chairman, and J. M. Todd, of Buffalo, and W. A. Collier, of Cleveland, secretaries. The first day was given over to revising the constitution, and the revision of the by-laws was taken up on the second day. Several changes for the better, prompted by experience have been made.

President Caldwell, of the Lake Carriers' Association, laid before the convention a remonstrance against the line carrying projectile law, which will apply to all lake steamers, passenger and freight, after the first of February unless congress in the meantime should take action to the contrary. Three copies of the remonstrance were signed by each of the delegates, and at once forwarded to Washington. This protest from practical men should have weight. While the law in question may be well enough for the ocean, it is altogether unnecessary on the lakes. It is hoped that congress will exempt the lakes from its provisions.

Other matters to come before the convention were the better regulation of raft towing on the lakes and connecting rivers, and the formulation of some plans for the avoidance of delay and damage in the passage of vessels through narrow and intricate channels, like the Sault, St. Clair, and Detroit rivers. The masters realized that it would be both delicate and difficult to attempt to control the movements of craft through neutral waters, but they hoped to devise some plan which would be binding on the members of their association, and which would be adopted by American masters generally.

It appeared that the delegates were not altogether in favor of the Burton bill to regulate raft towing, now before congress. This much is certain: The masters are well qualified from long experience to deal with the troublesome subject, and as they are men of intelligence, they ought to know just about what is necessary to protect the vessel interests. Of course, the lumber and timber interests must be conciliated in this matter. Tne masters probably will have a bill drawn to cover the situation. They intend to take up one or two important subjec s each winte', and concentrate their efforts thereon, rather than work in a scattering way.

The Buffalo association decided to install its recently elected officers, Thursday evening, to give the out-of-town delegates a good chance to participate therein. It had been intended to serve a nice lunch after the installation, but as it was found that the rooms were too small to accommodate all the members and their particular friends, this idea was dropped. Another year the boys mean to wind up with a fine supper in some large hall.

The delegates were made happy by liberal donations of fuel from Hand & Johnson, and E. L. Parrish. When they had got steam up, they were quite interested in watching one another's smoke.

The Buffalo association was presented by James Ash with a fine bi liard table and necessary equipments. It was about the only thing needed to complete their happiness, and they feel very thankful to the generous donor.

The association will open its navigation school as soon as the convention is out of the way. With a large chart room and tables, all necessary nautical instruments, and Capt. J. M. Todd as instructor, the school must bring forth good results. Capt. Todd was one of the brightest pupils of the late Capt. Bradford. The E. M. B. A. now has about 400 members. It is intended to institute branches at Toledo, Detroit and Milwaukee this winter.

The West Bay City Ship Yards.

Special Correspondence to the MARINE REVIEW.

WEST BAY CITY, Mich., Jan. 8.—Wheeler & Co.'s ship yard, which a few months ago was all life and activity, is very quiet at present. Work on the five vessels at Davidson's yard is being pushed forward very rapidly and the proprietor says he will have them all finished by the opening of navigation. In the steel yard at Wheeler & Co.'s the Keweenaw is still on the stocks, but the force of men employed is very small. The 900 men who were kept at work every day and a good share of the nights for the past year are gone and there remains about sixty in the whole department. In the wooden yard there are two vessels on the stocks, both duplicates of the Tampa, one for Cleveland parties and the other for Penoyer Bros., of Au Sable, Mich. The little steamer Sailor Boy, for Armstrong's "Boy Line," of river steamers was launched, Tuesday. Her boilers and machinery and all of the cabin work are still to be completed. The Canadian Pacific Railway car ferry is at Detroit, and F. D. Wheeler, superintendent of the joiner department of Wheeler & Co.'s yard, has gone to Detroit to oversee the work on her cabins.

Congressman Wheeler went to Washington, Monday night. Before leaving he said that he had no fear of being obliged to shut down his yard. The financial panic had affected ship owners to a certain extent and they were slow in making contracts, but he looked for a good year's work during the coming season.

Duluth Wheat Receipts.

Special Correspondence to the MARINE REVIEW.

DULUTH, Minn., Jan. 8.—The Duluth elevators are filling up very slowly with wheat. The receipts are only about 200,000 bushels a week and the increase is not great. The total amount now in store is about 3,500,000 bushels. Business on the board is very quiet just now and, while the receipts are running heavier than a year ago at this time, there is not enough to indicate very heavy stocks here when navigation opens in the spring. The flax in store amounts to about 60,000 bushels, and all other grains to about 6,500 bushels.

Major Quinn, United States engineer, is of the opinion that Superior cannot obtain the right to build the proposed central canal through Minnesota point. "The state of Minnesota is authority in the matter of rights," he says, "and until the state grants permission all efforts in any other direction will be useless. The principal objection to this proposed canal is that the Duluth canal and natural entry would immediately fall into disuse and get out of repair on account of the lack of money to sustain them. The government would not support so many entries. Of course, the central canal would be able to accommodate the business of both ports, but you must remember that it will take five or six years at the least calculation to complete this work with the limited means which the government would be liable to appropriate. Another objection would be this: When the wind blows from the east the waters of Superior bay and Duluth harbor flow out of the Duluth canal. When the wind blows from the opposite direction the current flows out of the natural entry. When it is calm there is a current running out at each canal. Now suppose we have a central canal and ultimately the natural entry and the Duluth canal become closed. You will readily see that the waters are liable to become stagnant and the consequences of such a state would become serious a half dozen years hence."

Last week's receipts were, but 60,000 bushels and the amount in store here now is nearly 1,000,000 bushels less than there was a year ago at this time. Capt. McDougall expected to leave for the Pacific coast in a few days, but the death of his eldest son, a boy of eleven years, may delay his trip somewhat.

Collector Johnson has just issued a report of the business of the Duluth custom house for 1890. The report is interesting for the stand it takes for the transfer of the Port of Superior from the Marquette to the Duluth custom district, a proposal the Superior people oppose most earnestly, though the convenience of the lake marine trading to the head of Lake Superior would seem to demand that the two places should be in the same customs district. The total arrivals and clearances were 2, 534. The foreign arrivals were 164 and the clearances 143, with a tonnage of 186,334. Coastwise arrivals numbered 1,102, and clearances 1,125, the tonnage being 2,554,020, making the total tonnage 2,740,354. The number of vessels now registered at Duluth is 32, with a tonnage of 8,034.46. In 1889 the total arrivals and clearances were 2,528, the tonnage 2,452,123 and the average tonnage 972. For the year the foreign imports amounted to $48,027.13 and the domestic exports $1,521,751. The imports were divided as follows: Free goods $35,027.40 ; dutiable goods, $12,999.73. Then there was $806 worth of merchandise in bond, with duties aggregating $568.05. The value of commodities imported at Duluth and transported to other ports in the United States during the past year was $70,833.35, the duties on the same amounting to $19,247.35.

THE Chicago Railway Journal says that a few years ago there were very few vessels on the lakes which would carry 2,000 tons of freight and shows some surprise in adding that there are now many that carry 2,500 tons. Bradstreets reprints this statement with an equal show of surprise. The editors of both of these excellent journals are referred to a statement in the last issue of the MARINE REVIEW from the report of the commissioner of navigation, showing that the number and tonnage of steam vessels of 1,000 to 2,500 tons on the lakes is greater than the combined ownership of this class of vessels in all other parts of the country.

Deep Channel to Tonawanda.

It is expected that there will be eighteen feet of water to Tonawanda next season. Major Stickney, government engineer, has entered into a contract with Hingston & Woods for removal of the obstructions at the waterworks inlet pier and Strawberry island On account of these obstructions, only 12½ feet of water could be depended upon except in high water time. The nature of the obstruction at the waterworks inlet pier is not definitely known but it is supposed to be a ledge of rock or reef, and its removal will be attended with many difficulties, as powerful anchorage must be made for the boats engaged in the work, in order to counteract the swift current. The work, to begin immediately, must be done during the winter, as the channel can not be obstructed during the season of navigation. The Strawberry island obstruction can be removed during the summer. The contractors will work by the day. If the channel is cleared by the opening of navigation Tonawanda's lake business, especially in ore, will be largely increased.

Barges to go around the Horn to the Pacific.

There is very little in the story of a shipyard to cost $1,000,000 being established by the American Steel Barge Company on Puget sound. Capt. Thomas Wilson and Capt. McDougall will leave for the Pacific coast shortly to consider the prospects for a shipbuilding plant there, but they go simply as a committee appointed at the last New York meeting to consider the advisability of such a move. McDougall says that some of the barges may be taken down the St. Lawrence and around Cape Horn for Pacific coast trade. The company now gives out its intention of going into the work of building boats of any kind for outsiders. The plan is to keep the Superior plant going by building barges on its own account when other work cannot be secured.

Changes in the Signal Service.

With the transfer of the United States signal service to the agricultural department some changes are proposed that are of the utmost importance to vessel owners and masters of the lakes. One feature of the new law is that which provides for but twenty local forecast officials in the whole country. At only twenty offices in the country will the men in charge be permitted to advance an opinion as to weather probabilities, based on their knowledge of general conditions and the immediate surroundings. In all other cases only such information as is telegraphed from Washington can be given out by the local officers. Interest in the work of the signal service on the lakes has shown a decided increase during the past few years, and an effort should be made to secure for Cleveland and other large lake cities, the privileges of local forecast offices. Unless the vessel owners and masters look to this matter themselves, they may find it very inconvenient to be without the opinion of the local officer which they have sought repeatedly in the past.

A matter especially important to vessel interests in Cleveland, is a proposed change of office location. The Cleveland office should be located in the Perry-Payne building, where fully 90 per cent. of the business connected with lake commerce is carried on, but it is understood that the owners of other large buildings offer inducements that may cause the office to be moved elsewhere. The advantages that would be derived from having the office of the signal service in the same building with the vessel interests have long been discussed, and now that a change is to be made, the vessel owners should stir themselves in the matter.

The Huron Ore Docks.

The Huron Dock Company in which Oglebay, Norton & Co. and Capt. Thomas Wilson are intetested has not as yet contracted for hoisting and conveying apparatus, although some machinery is being placed on the docks at Huron. The Variety Iron Works, manufacturers of the Hulett hoist, are putting up one leg on trial. The hoist is said to contain some improvement over similar machinery used on the Ashtabula docks managed by M. A. Hanna & Co.

Another Portage Lake Bridge.

The people of Hancock and Houghton, Mich., are engaged in an effort to build another bridge between the two towns, but it is more than probable that they will meet with opposition from the vessel interests. At a meeting of the board of supervisors of the county in which the two towns are located, held on Dec. 31, a petition was presented, praying the board to submit to the voters in the spring "the question of bonding the county for the purpose of building a free iron bridge across Portage lake between Hancock and Houghton." Jan. 20 was set by the board as the date on which arguments will be heard. The site proposed for the bridge is about 1,000 feet east of the present bridge, across the only wide spot between the present bridge and the Franklin stamp sands, or a little west of the docks of the Detroit & Lake Superior Smelting Works.

Casting of an Immense Cylinder.

One of the cylinders for the inclined triple expansion engines, building by the Cleveland Ship Building Company, was successfully cast this week. It measures sixty-six inches, inside diameter, by seventy-two inches, and with the steam chest and flange the casting weighs eleven tons. Perfect results were gotten from the first cast. This is the largest marine engine cylinder cast in this city and is believed to be the only one of the kind cast on the lakes. When it is considered that the engine will differ from anything of the kind ever turned out, progress in the work is a matter of interest.

The Lake Carriers' Association.

The Buffalo managers of the Lake Carriers' Association met, Thursday, and decided to hold the annual meeting in Buffalo March 4th. The annual meeting a year ago was held in January. The reason for the change this year is that some vessel owners take a vacation in January and February. Secretary Keep submitted designs from leading jewelers for the medal to be awarded by the Lake Carriers' Association for bravery in saving human life, and action was postponed until the annual meeting.

A communication was read from the Western Electric Company of Chicago, in relation to the introduction of electric-lighted buoys at prominent and dangerous points on the lake routes. The letter stated that the buoys in the Narrows and to Bedloes island at New York, have been lighted sucessfully in this manner, and that the plan is quite applicable to the lakes. The subject was referred to Col. Ludlow of the lighthouse department, who is stationed at Detroit, and has given much study to the light question. Capt. Ira H. Owen of Chicago informed the managers that he would attend the hearing before the House committee on commerce on Representive Burton's bill to regulate the towing of rafts on the lakes. He can argue from experience. Ex-Senator Conger will appear for the Lake Carriers' Association. No action was taken on the line-carrying projectile law, which was enacted a year ago, and whose application to the great lakes was suspended until the first of next February. The law will apply to the lakes at that date unless congress legislates to the contrary in the meantime.

Over-estimating the Virginia's Speed.

The statement published by the Milwaukee Sentinel and copied elsewhere around the lakes, to the effect that the twin screw passenger steamer Virginia. building by the Globe Iron Works Company for the Goodrich Transportation Company, will make 18 miles an hour easily and 22 or 23 miles if crowded, is decidedly misleading and can be of no benefit to either builder or owner. The boat can not be built under the requirements for anything like the speed credited to her in this story. The builders did not contract for better than a sixteen-mile boat, although they confidently expect her to develop a speed of eighteen miles an hour on a trial that will be given her over a measured mile. They expect no more than this, however, at an outside. A boat to suit the service in which the Virginia will be engaged can not be cut away and must of necessity be of deep draft. She must have a certain measure of fullness that will act against speed.

Record of Speed and Big Cargoes.

[*Masters or owners are invited to report improvement on this list.*]

Iron ore: Maryland, Inter-Ocean Transportation Company, of Milwaukee, 3,322 gross or 3,737 net tons from Escanaba; Pontiac, Cleveland Iron Mining Company, of Cleveland, 2,933 gross or 3,285 net tons from Escanaba; Brazil, 2,932 gross tons or 3,284 net tons from Escanaba; Corsica, Mutual Transportation Company, of Cleveland, 2,921 gross or 3,271 net tons from Escanaba.

Grain: Steel boats—America, Drake syndicate, 111,507 bushels of Corn, Chicago to Buffalo; Emily P. Weed, Hollister Transportation Company, 111,000 bushels of corn, Chicago to Buffalo. Wooden boats—Neshoto, R. R. Rhodes, of Cleveland, 102,000 bushels of corn from Chicago. From Lake Superior—Western Reserve 96,258 bushel of wheat from Duluth.

Speed: Owego, Union line, of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour; Saranac, Lehigh Valley Line, of Buffalo, Buffalo to Lime-Kilns, 240 miles, 15 hours and 10 minutes, 16 miles an hour.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St.

Stocks.	Par Value.	Bid.	Asked.
Cleveland Iron Mining Company	$ 25 00	$ 17 00	$ 18 00
Champion Iron Company	25 00	90 00	100 00
Chandler Iron Company	25 00	39 00	40 00
Chicago and Minnesota Ore Company	100 00	.....	110 00
Iron Cliffs Iron Company	50 00	120 00	125 00
Jackson Iron Company	25 00	90 00	100 00
Lake Superior Iron Company	25 00	69 00	70 00
Minnesota Iron Company	100 00	70 00	80 00
Pittsburg Lake Angeline Iron Co	25 00	145 00	.....
Republic Iron Company	25 00	28 00	30 00
Michigamme	25 00	8 50	10 00

Iron Ore, of Ishpeming, Mich., presents some interesting reading in its last issue regarding the great ore mines—Lake Superior, Cleveland Lake Angeline and others—in the immediate vicinity of that town. In the thirty-eight years that the Cleveland mine has been in operation it has produced 4,494,950 gross tons of iron ore, and the product of the year just ended has exceeded that of any previous year, the amount mined and sent out being 331,752 gross tons. The nearest approach to this annual product was in 1889, when there was produced and marketed 274,048 gross tons. For the season just closed the Lake Superior shipped 318,321 gross tons of ore, 31,088 tons of which were all rail. This brings the total shipments of the mine to date up to the very elaborate figures of 5,042,461 tons, leading all mines of the country in total production, and the shipments of the past season outstrip by 15,412 tons the product of any single season in the past. Of course, the mine has been in operation 37 years, but for very many years in its earlier life it was wrought in a primitive manner, as it was without the improved appliances that have resulted within a very few years past. The product of the Lake Angeline for 1890 was 261,681 gross tons, this exceeding by 32,011 tons the output for any similar period in its history. The Iron Cliffs mine, recently acquired by stockholders in the Cleveland Iron Mining Company last year produced 175,525 gross tons of ore, making a grand total of 476,007 tons. The product for the past season was 40,909 tons in excess of that of any one previous year. The output of the different Ishpeming properties for the past season is: Cleveland, 331,752 tons; Lake Superior, 318,321 tons; Lake Angeline, 261,681 tons; Iron Cliffs, 296,515 tons; East New York, 37,529 tons; Winthrop, 108,676 tons; Fitch, 16,255 tons; Detroit, 6,080 tons; New York, 2,422 tons; total, 1,379,231 tons.

Rail shipments of ore over the Duluth, South Shore & Atlantic Railway during 1890 were 186,149 gross tons. Lake shipments from Marquette were 1,316,353 tons and from St. Ignace 15,911 tons, making a total of 1,518,413 tons handled by the Duluth, South Shore & Atlantic for the year.

Raphael Pumpelly and C. R. Van Hise, of the United States geological survey, have been examining the new Aticokan iron range, of Ontario, and it is said that they have bought 20,000 acres for an American syndicate, in which John D. Rockefeller and some of the owners of the Illinois Steel Company are said to be interested.

A cave-in that had been expected occurred at the big Norrie mine a few days ago. The break is between shafts Nos. 2 and 3 and was general down to the fifth level, letting down about 600 feet east and west and 300 feet across the ore vein. The cave "breaks" hundreds of thousands of tons of ore.

It is thought that at least half a dozen new mines will begin shipping from the west end of the Gogebic range next season. A great deal of money has been spent by local capital on small properties in that vicinity and it is unfortunate that the market for ore does not present a more encouraging outlook at the time when the mines are about to begin shipping.

A spur to the McComber mine on Armstrong lake was surveyed last week by R. Angst, chief engineer of the Duluth and Iron Range, and County Surveyor Coffman. This insures another shipper from the Vermilion next season.—Two Horbors Iron News.

Another Consular Report on Cuban Ores.

Mr. A. De C. Crowe, British consul at Havana, is the latest to call the attention of his government to the iron ore deposits of Cuba, and Industries of London, comments on the report in detail, on the claims that "the Americans, although the most enterprising of people within the confines of their individual business, are very shy investors in industries beyond their immediate control, and where they are found placing their money abroad we may well conclude there is good prospect of success.

According to Mr. Crow's report it appears that nine years ago the first iron mines were reported and claimed, the right of working 780 hectares being obtained from the government. In consequence of this "many fields and lodes of rich iron and manganese and other metals, including some gold and asphalte," were discovered. Mr. Crowe says the field has been left to the Americans, who, during the last decade, have made some profitable ventures. "The Jurga iron mines have now for six years been successfully worked with American capital, and recently another large group of similar mines has been bought by a Philadelphia syndicate, who have formed a company called the Siga Iron Company, to work them with a capital of $5,000,000." Mr. Crowe further states that, "The price paid is reported to be $150,000 cash, with a royalty of 30 cents silver per ton on the first 60,000 tons of ore extracted; 25 cents silver per ton the next 40,000 tons, and 25 cents per ton on all extracted over and above 100,000 tons during the first year's working." Operations were to commence last October by the construction of a bridge and artificial harbor, and a railway thence to the mines. The analysis of the surface ore from one of these mines gave 28 per cent. of iron and 29 per cent. of manganese (metallic). This mine is situated on the coast, and it is computed that the surface ore and that known by borings to exist in the lodes will give 6,000 monthly tons for the next fifty years. The cost of breaking the ore and of its shipments to the States, is calculated from $6 to $8 per ton; which should leave a profit of $7 per ton. Mr. Crowe's report further states that ten distinct groups of iron mines have been discovered and claimed for working. In June last, eight of these were for sale; the owners, although too poor to commence operations themselves, appear to have held an exaggerated opinion of the value of their properties, and hence they have remained unworked for some years. Apparently, however, waiting has brought wisdom and there are indications that a further extension of American enterprise in this field may take place; more especially as German speculators are likely to appear in the field. Some of the ore is said to contain neither phosphorus nor sulphur. In another place it is said that there are "500,000 tons of rich iron on the surface," and the American experts who have reported on the question state that all the mines are "more or less extensive and valuable, some exceedingly so." "All the mines," it is added, "are exempt during twenty years from export duty, and are allowed free import of coals. (There is abundance of hardwood on the island). These exemptions, facility of obtaining labor, the low rates of freight to the estates, and the steady demand for iron, ought to facilitate and render profitable the working of these properlies."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

JOHN M. MULROONEY, ... } PROPRIETORS.
F. M. BARTON, ... }

Published every Thursday at No. 510 Perry-Payne Building, Cleveland, O.

Lake Tonnage from Lloyd's American and Canadian Insurance Registers for 1890:

	Number of boats.	Net tonage.	Value.
American	2,053	846,489	$58,113,300
Canadian	647	132 971	3,989,130
Totals	2,700	979,460	$62,102,430

According to the report of William W. Bates, United States commissioner of navigation, 46 per cent of the new tonnage of the country was built on the lakes during 1889. This is a percentage greater than the work of the Atlantic coast and western rivers combined, and almost equal to the whole work on the Atlantic and Pacific coast. In 1890 the tonnage built on the lakes is but very little less than that built on the Atlanti and Gulf coast. Tonnage built on the lakes during the past five years was as follows:

	No. of boats.	Net Tonnage.
1886	85	20,400.54
1887	152	56,488.32
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
Total	902	393,597.03

Annual tonnage entries and clearances of the great seaports of the world, for 1889: New York, 11,051,236 tons; all seaports in the United States, 26,983,315 tons; Liverpool, 14,175,200 tons; London, 19,245,417 tons.

St. Mary's Falls and Suez canal traffic: Number of boats through St. Mary's Falls canal in 1889, 234 days of navigation, 9,579; tonnage, 7,221,935. Number of boats through Suez canal during 1889, full year, 3,425; tonnage, 6,783,187.

Tonnage passing through Detroit river during 234 days of navigation in 1889, amounted to **36,203,606** *tons. Ten million tons more than the entries and clearances of all the seaports in the United States, and three million tons more than the combined foreign and coastwise shipping of Liverpool and London.*

Entered at Cleveland Post Office as Second-class Mail Matter.

ON June 19, 1886, nearly five years ago, congress ordered a life saving station established at or near the mouth of Niagara river. About the same length of time has elapsed since a station was ordered at Ashtabula harbor. Notwithstanding that the commerce of the lakes is greater and more important than that of American ships in both Atlantic and Pacific trade, the superintendent of the life saving service has allowed the matter of building and equipping these stations to drag along from year to year until it will now cost the government thousands of dollars to secure a site at either place, when the land might have been obtained for nothing if looked after in time. The superintendent's plea is poverty in the department, although work of far less importance has been carried out elsewhere. Mr. Kimball now condescends to inform lake interests that part of $50,000 appropriated for seven new stations this year may be used for the Niagara station.

SENATOR FRYE, from the committee on commerce, has reported favorably several bills embodying the recomendations of the recent international marine conferences relative to the merchant marine service, and especially the regulations pertaining to steam vessels, and the formation of a board under the supervision of the secretary of the treasury, to promote the welfare of and interest of the sea-faring service generally. While the bill providing for the establishment of a marine board does not meet the desires of the merchant marine in this regard, it is one step in the right direction and some good may be expected from it. It is the initial step toward the establishment of a department of marine.

AT Chicago a few days ago Judge Richard Prendergast in his inaugural address as president of the Chicago ship canal trustees made some notable utterances on the alleged need of defenses along the lake front. He repeated the assertion that over 125 war vessels on the British naval list could pass up to the lakes from the Atlantic, subjecting the northern frontier to invasion by a foreign fleet. He also declared that it has been the policy of the Canadian government to foster the construction of steel vessels for commercial purposes to navigate the lakes, susceptible of use as armed cruisers in case of hostilities. The aim of these unusual utterances just now is to help the Hennepin canal scheme, but the effort is a feeble one. It is well known to everybody connected with the lake marine that the number of Canadian merchant vessels on the lakes susceptible for use as armed cruisers does not amount to a drop in the bucket as compared with this class of American vessels on the lakes. If there are 125 vessels of the British naval list that can pass through the small locks of the St. Lawrence canals, the announcement will undoubtedly be a surprise to many people who had a better opinion of Her Majesty's war fleet.

A PETITION favoring the transfer of the revenue marine from the treasury department to the navy is being generally signed on the lakes. The Senate bill providing for the transfer is favored by leading members of both the revenue marine and the navy departments, as well as navigation interests over the entire country, and it is unfortunate that its passage should be retarded on account of the preferences of a few senators who have succeeded in keeping it from a vote.

Cleveland Leads the Country in Tonnage.

Cleveland now owns more tonnage than any other customs district in the United States. The aggregate is 205,855 tons. When the report of the commissioner of navigation was compiled, January 30 last, New York was slightly ahead of Cleveland in tonnage owned but the foregoing figures are from the report of Collector of Customs Gary for the year 1890 and they surpass New York. Following is a classification of the tonnage of the district, as per enrollment:

	No.	Gross tonnage.	Net tonnage.
Sail vessels, wood	94	51,637.51	49,084.13
Steam vessels, wood	142	114,253 67	92,626.76
Steam vessels, iron and steel	18	38,558,66	30.579.79
Barges, wood	5	1,196.81	1,179.29
Pleasure yachts, wood	5	208.69	142.13
Total	264	205,855.64	173,612.10

The total clearances and entries in district, foreign and otherwise were: Sail vessels, 5,003; tonnage, 2,708,838. Steamers, 7,064; tonnage, 6,774,702. Total, 12,067; tonnage, 9,483,539.

The lake traffic of Chicago for 1890 shows a decline in both receipts and shipments. In receipts a gain is apparent in iron ore, with losses in coal, lumber and salt. Flour shipments were about the same as in 1889, but a very large decrease is shown in grain, nearly 24,000,000 bushels. The following statements are compiled from reports furnished by Deputy Collector Hill:

Receipts—Coastwise receipts at Chicago and South Chicago during 1890 and 1889:

	1890.	1889.
Coal, tons	1,263,500	1,329,364
Iron ore, tons	788,854	652,847
Lumber, 1,000 feet	1,416,768	1,487,732
Salt, barrels	619,791	861,495
Cement, barrels	256,402	.....

Shipments—Coastwise and foreign shipments from Chicago and South Chicago during 1890 and 1889:

Flour, barrels	1,803,514	1,821,944
Wheat, bushels	6,648,051	10,330,785
Corn, bushels	55,663,042	66,239,702
Oats, bushels	18,653,821	29,399,918
Barley, bushels	941,683	735,331
Rye, bushels	2,043,466	1,447,062
Total grain, bushels	83,950 063	108,152,798

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Proposition for a Light at Pelee Passage.

Capt. F. B. Hackett, of Amherstburg, writes Secretary McKay, of the Cleveland Vessel Owners' Association, saying that many of the lake masters have requested him to place a light-ship on the middle ground in Pelee passage, Lake Erie, to the east end of the shoal. Capt. Hackett expresses a willingness to have a light-ship, with heavy fog signal attached, moored there by spring, if he is given any assurance of return for the expenditure that would be needed. While it is generally agreed that the light-ship maintained by Capt. Haskett at Bar point has resulted in a great saving from the expense attached to strandings there in the past, and that a similar ship at Pelee passage would be of almost equal benefit, it is not probable that either the Lake Carriers' Association or the Cleveland Vessel Owners' Association can accept this last proposition, as the expense attached to the maintenance of private lights is already too great.

Steel Steam Yachts.

The keel for the Wade yacht was laid down at the yard of the Cleveland Ship Building Company this week and the work will go forward rapidly on what is the largest yacht on the lakes. The word yacht, by the way, is of Danish or German origin and signified chasing or hunting, and originally fast ships used for pleasure or racing were called yacht ships. It is probable that there will be another yacht turned out of the Cleveland company's yard before spring. Negotiations with eastern parties have been under way and there seems to be no reason now why they will not be concluded shortly. The dimensions of the craft are 117 feet long, 17 feet beam and 16 feet deep, with flush deck, mahogany joiner work and schooner rig. The engines will be triple expansion with Scotch boiler and the contract speed is sixteen miles.

Other Cleveland parties are considering the matter of building a steel yacht, and if the matter is decided favorably, efforts will be made to have the craft surpass anything on the lakes.

A Few Companies Control the Steel Trade.

The Engineering and Mining Journal estimates the production of steel ingots in the year 1890 at 4,900,000 net tons, and of steel rails 2,200,000 net tons. The most remarkable feature of the trade in recent years is its tendency to be concentrated in the hands of a few large companies. Ten years ago eleven Bessemer steel companies were engaged in rail making. Now, although the production has more than doubled, nearly the entire rail product of the county is made by seven companies. The following is a list of these companies, with their estimated annual capacities for rail making:

	Tons.
Illinois Steel Company, Chicago (four plants)	925,000
Carnegie Bros. & Co., Pittsburg (two plants)	600,000
Cambria Iron Company, Johnstown, Pa	225,000
Pennsylvania Steel Company, Steelton, Pa	200,000
Lackawanna Iron and Coal Company, Scranton, Pa	225,000
Scranton Steel Company, Scranton	225,000
Bethlehem Iron Company, Bethlehem	200,000
Total capacity	2,600,000

The Iron Cloud and the Ore Dealers.

A great many rumors of an unsatisfactory nature have been going the rounds regarding the undertakings of the Schlesinger syndicate and the failure of the mine manager to make prompt payments to the miners. The rumors culminated, Thursday, in a report from Milwaukee to the effect that Mr. M. A. Hanna had been given the presidency of the Chapin mine and control of other Schlesinger interests. M. A. Hanna & Co. are the sales agents for the mines and members of the firm of M. A. Hanna & Co. are otherwise interested in the vessels and docks engaged in handling the ore of the syndicate. The mines of the syndicate are all valuable and profitable and the present deal will undoubtedly strengthen the companies. The details are not known but it is probable that the interests of Mr. Schlesinger and the capitalists whom he represents are not as greatly changed as might be expected. A great many miners, single men mostly, have been laid off at the Chapin but the mine is no exception to the rule in this regard. Mining forces have been reduced all through the Lake Superior district and had the Schlesinger management begun the work of limiting production earlier the results would have been somewhat different. The older ore companies are all in a position to withstand the money stringency, and from the manner in which vessel owners accept the situation it seems that they could also bridge over a year of poor freights if they must do so.

Hearing on the Raft Bill.

Representative Burton will get a hearing on the raft bill on Tuesday next and hopes for a hearing before a sub-committee of the Senate on the following day. Mr. Owen, of Chicago, will be in Washington to give the congressional commiitees some practical information regarding the disadvantages under which vessels navigate narrow channels, on account of the need of regulations in the matter of raft towing.

A Valuable Book of Reference

The MARINE REVIEW has made arrangements to offer Capt. Howard Patterson's "Illustrated Nautical Dictionary" to anyone sending us five yearly subscribers at $2 each, or the book with a year's subscription to this journal at $4. The book contains 500 descriptive engravings and treats of general nautical terms, terms of wooden and iron shipbuilding, various types of marine engines, etc. Capt. Howard Pattersou is a master mariner and well known author.

Vessel and Machinery Exchange.

The fact that the MARINE REVIEW receives daily inquiries concerning the space devoted to items mentioning vessels or machinery for sale or wanted, is a pleasing indication of its adverting value. Last week a vessel agency in Cleveland had inquiry for a steambarge. They sent an item, stating what was wanted, to the REVIEW, and this week received a reply describing a barge that suited them exactly. This is an instance merely showing the benefits from the use of this column. There are five additions to the list this week. Notice them on page 13.

Big Fines at Port Huron.

Port Huron vessel owners are much disturbed over the actions of the customs officials in the seizure of several boats under a very strict enforcement of rules. The tug Mollie Spencer and scow Forester have both been fined $1,500 and the tugs Skater and Mystic $500 each for not reporting. In a letter published in one of the Port Huron papers, W. E. Leonard criticises, very severely, the enforcement of laws by Messrs. Geer, Millis and Dey, government officials, and it is evident that the shipping interests are stirred up over the seizure of the boats. The Mystic is owned by Capt. John Cornwall, the Mollie Spencer by James Lynn, the Forester by Capt. William McCulloch and the Skater by Capt. John Miner.

Work of the Ship Yards.

The new Lakeside Transportation Company, which proposes to run boats between Cleveland and Lake Erie islands, stopping at Huron, Lorain and other points, is figuring for the construction of a steamboat of medium size. The boat will in all probability be built in Cleveland and it is hoped to have her ready for work next season in connection with the propeller Lakeside, recently purchased by the new company.

The Age of Steel for Jan. 3rd, 1891, contains articles by many of the most eminent writers in the country on "The Industrial Condition, Growth and Outlook in the South and West."

Around the Lakes.

The tugs J. L. Westcott and L. Young are being rebuilt at Dunford & Alverson's shipyard, Port Huron.

The annual meeting of the Dry Dock Association of the Lakes will be held at the Russell house, Detroit, on the 14th inst.

The bill providing that one person may act as engineer and pilot on steam launches of ten tons and under has passed the House.

Capt. William Clark, who was mate on the steamer Robert Mills last season, has been appointed master of the steamer S. E. Peck. Capt. M. Macartney, mate of the steamer Passaic, will command her next season.

A statement published by one of the Ashland papers indicates the growth of the lumber business at the head of Lake Superior. In 1880 the Ashland lumber mills manufactured 8,000,000 feet while in 1890 the aggregate was 136,000,000 feet.

Capt. James Moffat, for fifty years connected with the ferry busines between Port Huron and Sarnia, has sold out his interests to Nelson Mills, of Marysville, and will be succeeded as manager by Capt. Neil. Capt. Moffat built the ferry Sarnia, formerly well known on the river St. Clair. The price was $15,000, and Henry McMoran, of Port Huron, was also interested in the purchase.

That part of the straight channel to the lake from Toledo already finished has proven a great convenience to craft passing out and going into port with cargoes, as 16 feet of water is found at all points. There are $250,000 available to continue the work, $140,000 of which will be used for dredging, and the balance for dyking. Contracts were let at Cleveland not long since to L. P. and J. A. Smith for the dredging of 350,000 cubic yards, and to James Rooney of Toledo for dredging 200,000 yards. There are about 1,000,000 more yards to be dredged before the channel is completed.

Secretary Windom has made a decision of considerable importance to lake sailors. H. B Olson, captain of the schooner H. B. Moore, had as a mate on his vessel John Martin Olsen, the latter not being a citizen of this country. On the matter being brought before the collector of customs at Chicago, the captain discharged Olsen as a mate and re-employed him as a sailor. However, though nominally a common sailor, Olsen was allowed all the authority of a mate. Secretary Windom had the case referred to him, and decided that the captain was subject to the usual penalty, fifty cents a ton for the trip, or $92. This shows conclusively that aliens cannot serve as officers on United States vessels, even where it is sought to evade the law as in this case.

Cleveland Notes.

Capt. P. L. Millen, of Detroit, last season in the steamship Iron King, takes the Lake Superior Iron Company's steamship Joliet next season.

Capt. George P. McKay, secretary of the Cleveland Vessel Owners' Association, is making preparations for the annual meeting to be held on the 13th inst.

Capt. John Westley Hazen, formerly master of lake vessels, but of late employed at the yard of the Fisher & Wilson Lumber Company, died at the marine hospital a few days ago.

The steamship Britannic was not chartered for storage and delivery of corn at Buffalo from Chicago at 3½ cents as reported a few days ago. There is no corn or wheat offering as yet to vessels in Chicago. The Britannic was offered a load of flaxseed at 3 cents but refused it and it was taken by another vessel.

The annual meeting of the Cleveland Vessel Owners' Association next Tuesday, will be held in the rooms of the Excelsior Marine Benevolent Association, old board of trade building, Water street. A great deal of important business is awaiting attention, and Secretary McKay asks for a full attendance of members.

The Cunard Company directors propose taking the present compound engines out of their steamers Umbria and Etruria and replacing them with triple expansion engines to be constructed by Clyde engineers.

E. M. B. A.

INCREASING MEMBERSHIP.

Lodge No. 3, of Cleveland, now has 125 members. At the regular weekly meeting on Friday last, Chas. L. Hutchinson, Chas. H. Hinslea, Edward Morton and Geo. Bartholomew, were initiated, and C. C. Allen, Charles Benham, Wm. Gerlach and James Curran, were elected to membership. Officers elected for the ensuing year are: John B. Hall, president; Wm. S. Mack, first vice-president; Henry W. Stone, second vice-president; Edward Mooney, recording secretary; W. A. Collier, financial secretary; John Nelson, treasurer. The other officers—chaplain, marshall, warden, sentinel and auditing committee—will be appointed by the president at the next regular meeting. Delegates to the first meeting of representatives of the different lodges on the lakes, which began work in Buffalo, on Tuesday, were: Ed. Kelly, R. J. Crowley, John B. Hall, Joseph A. Holmes, W. A Collier, Henry W. Stone, Wm. Cumings, John Nelson, W. S. Maek and Thomas Jones. At a special meeting of Lodge No. 3, held Saturday, William Gerlach and James Curran were initiated.

The Buffalo lodge elected officers Monday evening, as follows: President, Alexander Clark; First Vice-President, F. D. Welcome; Second Vice-President, J. H. Dissett; Treasurer, A. J. McDonald; Financial and Corresponding Secretary, J. M. Todd; Marshal, E. F. Thorpe; Warden, J. H. Green; Sentinel, D. Buia; Chaplain, William Dickson. Last year's officers thus were re-elected with the exception of P. Macfarlane, who could not serve as treasurer owing to absence from the city during the winter. A nautical school will be opened immediately. Capt. J. M. Todd, who is well qualified for the position, will act as instructor. The conveniently arranged chartroom will afford good facilities for the pupils.

Delegates to the convention or grand lodge at Buffalo from Port Huron were A. Muir, W. A. Ashley, John Ivers and Thomas Cowen. Lodge No. 1 elected Captains W. W. Stewart, Alex. R. Sinclair, Phin Kenyon, D. H. Sinclair, Eugene Goodwin, John Griffin and Lewis Carry to full membership at the meeting held, Thursday evening, of this week. It is generally claimed in Port Huron that this lodge has as many handsome masters as any on the lakes. John Cotton, an exceedingly ancient mariner has been appointed narrator of all stories about early navigation.

Buffalo's representatives in the convention are: Alex. Clark, P. Macfarlane, J. M. Todd, F. D. Welcome, J. H. Dissett, William Dickson, Thomas Collins, P. J. Kenny, A J. McDonald, M. Niland, and Walter Robinson.

Developements in Marine Engineering.

The three great developements of marine engineering that have been made in the past ten years are: (1) Increase in working pressure from an average of 75 lbs. to an average of 150 lbs. per square inch; (2) the adoption of the triple and quadruple expansion system, so as to utilize steam of this high-pressure efficiently; (3) the adoption of artificial means for obtaining sufficient draught for the consumption of coal, and, when desired, for an increased consumption of coal so as to give an augmented supply of steam without additional boiler capacity—with the result that in naval ships now with practically the same weight of machinery, the indicated horse power is nearly double, and in the mercantile marine the indicated horse power is 50 to 75 per cent. more for the same weight of machinery as was used fifteen years ago, the consumption of coal being 20 per cent. less than ten years ago, and 25 to 30 per cent. less than fifteen years ago.—Seaton.

The American Manufacturer estimates the total production of pig iron in 1890 at 9,091 979 gross or 10,183,016 net tons. This is 1,666,937 net tons greater than in 1889, which was the year of largest production prior to 1890. The estimate is based on the report of the American Iron and Steel Association for the first half of the year, and the Manufacturers' monthly tables of production for the second half of the year.

Features in the Hull of a Great Atlantic Liner.

The current issue of the great technical journal, Engineering, of London, presents an excellent engraving of the White Star steamship Teutonic, with interesting reading regarding special features in this great Atlantic liner, whose time is said to have been slightly better than the City of Paris. There is nothing unusual about the machinery of the Teutonic, or her sistership the Majestic, but the hull construction presents several novel features. The dead wood of the ship is cut out aft, so as to form a screw aperture, and in this respect the vessel has somewhat the appearance of a single screw ship. Through this aperture the ends of the blades of both screws pass when revolving, and the propellers therefore overlap. In order to prevent them striking each other one screw is placed slightly further aft than the other, the shafting being necessarily of unequal length. This arrangement allows the bosses of the screws to be placed nearer the middle fore-and-aft line of the vessel, and shorter outboard shafting is one of the advantages thus secured. Another advantage is that the screws themselves are better protected by the overhanging after structure of the hull, and there is considerably reduced danger of damage to the blades when docking, a serious matter for consideration when the rival merits of twin and single screws have to be considered. When this plan was first proposed a good many engineers and naval architects were doubtful whether the intersection of the imaginary cylinders traced by the screws in revolving would not be prejudicial to the performance of the vessels on account of the race from the foremost screw striking the after propeller. This has not, however, been found to be the case in actual practice, if one may judge by the speed attained by these vessels. The bottom of the boat is of a modified bracket system, with water-ballast tanks at the forward and after part. There is a plate keel, and below a bar keel, which is 17 inches broad and 3½ inches deep. In the midship part channel iron frames are used, some with reverse angles from the floor to the orlop deck. The fore foot is well rounded up in the manner characteristic of Sir Edward Harland's ships, and to connect the keel bar to the stern post there is a steel casting about 40 feet long. This is of a flattened Y section, so as to take the plating, the garboards, before the casting is reached, being across the keel; after that the plate is split to fit into the arms of the Y. The stern is of novel construction. The vessels are propelled by twin screws, and these overlap at the tips (as already described in this notice), the starboard screw being carried some feet further aft than that on the port side, in order to get clearance. There are no outside stern tubes, in the proper acceptation of the term, the propeller shafts being carried in what are, strictly speaking, protuberances in the run of the vessel. At the extreme after end, however, especially with the starboard tube, which is carried furthest aft, the formation almost approaches a complete circle, the attachment to the skin of the ship being a web of double plating. There are, of course, no large steel castings for the stern brackets, such as are characteristic of ordinary twin screw vessels. The frames of the ship aft are bulged somewhat out to meet the stern tubes, which are built up of frames and plating. The frames are not bent to a complete circle, the ends being riveted to the ship frames. At the forward part of the stern tube the frames are of a flattened U section, but as they come aft the arms of the U become longer, and finally are curved in towards each other, until the last frames take somewhat the form of two SS's placed back to back, thus ∪∫. About five or six of the extreme after frames are stout steel castings made to shape, the others being of the ordinary construction. The stern frame is built up of five steel castings. There is a screw aperture of more than ordinary length, as fore-and-aft room has to be allowed for the overlapping of the propellers. The stern post is of cruciform shape, the transom terminating in two solid rings, which form the ends of the stern tubes. The propeller shafts are about 16 feet apart between centers. The rudder post has a slight rake. The upper deck falls away a little aft to allow for the sweep which the yoke takes owing to this feature.

Affairs in Admiralty.

CHICAGO BRIDGE COLLISION CASE.

Judge Blodgett's opinion in the case of the owners of the schooner City of Toledo against the city of Chicago is printed in full in the current issue of the Federal Reporter. The schooner was proceeding up the river in tow of a tug at a safe speed. The tug whistled for the opening of the Clark street bridge and the bridge tender rang the bell to indicate that it would be opened. On trying to swing the draw he discovered that the lock was out of order and, instead of hoisting the customary signal to show that he could not swing the draw, he stopped to investigate the condition of the lock, and did not signal the tug uutil it was too near the bridge to be able to stop the schooner. There was yet time to swing the draw, had it been in good order, when the bridge tender finally signaled his inability to do so. The tug, casting off the schooner, passed under the bridge, while the schooner collided with it. There was evidence that the city superintendent of bridges had notice of the defective condition of the lock. The court held that the tug was not in fault for not slacking its speed as soon as it discovered that the draw was not swinging, and the city is solely liable for the collision. Though the ringing of the bell on the bridges across the Chicago river, just before the draw is swung, is intended as a signal to persons on the street and bridge, it may be treated by an approaching vessel as an answer to her signal to open the bridge, and she is not in fault in proceeding on the strength of it, although the draw may not be swung immediately.

Where the sheriff, by virtue of a writ of execution, seizes a steamboat and, after taking actual possession, runs the boat for a few days without the consent or knowledge of the owner, one who acts as master or pilot during the time must look to the sheriff for his compensation, and has no lien against the boat.

In a suit against a wharf owner for damages alleged to have been occasioned to a vessel at a wharf by reason of obstructions under the water, Judge Brown, of New York, decided that the fact of the existence of such obstructions, and that the damage was occasioned by them, must be clearly proved before the ship owner can recover.

According to Judge Brown, of New York, the letting by charter of a vessel not in existence, but "to be built" is a maritime contract as respects the voyages to be made under it, and the guaranties it contains as to speed and draft. In such a contract the building of the vessel is but preliminary to the substantial part of the agreement, viz., the delivery of the vessel for navigation as per charter.

In the spring of 1887 the propeller Burlington cast her tow of lumber barges adrift off Point au Pelee, Lake Erie, and two of them, the Vanetta and Star of Hope were wrecked. Proceedings for damages were instituted shortly afterward and it was only last week that Judge Brown, of Detroit, now Justice Brown, of the United States supreme court, ordered the owners of the Burlington to pay $5,351 into court in settlement of the claims of the owners of the Vanetta and Star of Hope.

American Boilers are the Best.

The Financial Times, of London, is very much exercised over a statement by Mr. Mathews. the superintending engineer of the Pacific Mail Steamship Company at San Francisco, that underwriters all the world over will insure a vessel plated with less thickness of American iron than English iron, and that boilers made of Pennsylvania iron are much longer lived than any of English manufacture. Boilers lately taken out of the City of Pekin, City of Sydney and City of Panama, steamers built by the late John Roach, which had been in service for from fourteen to seventeen years, were in fairly sound condition when removed, whereas, as stated by the Times, the life of British boilers seldom exceeds ten years.—American Manufacturer.

The Italians have been experimenting with petroleum as fuel for their warships. It has proved so much of a success that it is to be used permanently in the navy, and a saving of 3,000,000 francs yearly is expected thereby.

M. E. B. A.

The Buffalo branch, No. 1, has elected and installed officers as follows: Past president, J. W. Brooks; president, Frank Miller; vice-president, Julius Rausch; treasurer, H. M. King; financial secretary, John Rainey; recording secretary, James Blair; corresponding secretary, W. McNulty; conductor, J. W. Crone; doorkeeper, Tom Ingram. J. W. Gregory was elected delegate to the national convention to be held in Washington on Jan. 26.

Mr. W. E. Elliott, chief engineer of the Goodrich line, and president of M. E. B. A., No. 9, of Milwaukee, has been in Cleveland during the past week. We acknowledge receipt, through Mr. Elliott, of an invitation to the fourth annual ball of the Milwaukee organization to be held, Thursday, Jan. 29. The officers are: S. B. Leggatt, past president; W. E. Elliott, president; L. H. Stone, vice-president; Frank Coons, treasurer; John Lougy, recording secretary; Thomas Murphy, financial secretary; David Leonard, chaplain; James Daley, conductor; Fred. Huerth, doorkeeper. Committee of arrangements—W. E. Elliott, J. Havelick, Chris. Olson, D. W. Chipman, Jr., and James Daley. Reception committee—L. Stone, A. Ellsworth, Henry Johnson, Thomas Albrighton, Alex. Staley, Frank Coons, S. B. Leggatt, Jos. J. Krach, T. W. Sheriffs, Charles H. Wilcox, John Lougy, Fred. Troegel, Barney Van Hooten, Charle Vaughan, William Ahern, John Cantwell, Charles McCarthy and Jacob Frey. Floor committee—James Daley, chief; Nick Smith, Thomas Coughlan, William Hunter, John F. Fogg, David Leonard, Julius Juneman, D. W. Chipman, Jr. and Chris. Olson.

J. H. Webster, chief engineer in the Chemung last season and well known around the lakes, will be in charge of the engines of the twin screw passenger steamer Virginia, building for the Goodrich line. G. P. Roth will be chief in the new wooden boat for the same line.

U. S. ENGINEER OFFICE, BURLINGTON, Vt., Dec. 22nd, 1890. Sealed proposals, in duplicate, addressed to the undersigned, will be received at this office until 11:30 a.m., January 13, 1891, and then publicly opened, for blasting and removing 247 cubic yards of rock, more or less, from two shoals between Sister Islands and Cross-over light, Saint Lawrence River N. Y. Attention is invited to the Acts of Congress approved February 26th, 1885, and February 23rd, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Detailed information can be had on application. M. B. ADAMS, Major of Engineers. Jan. 1-8

DREDGING AT OGDENSBURG HARBOR, New York. U. S. Engineer Office, Burlington, Vt., December 22nd, 1890. Sealed proposals, in duplicate, addressed to the undersigned for 270,000 cubic yards, more or less, of dredging; 200,000 yards from the city front channel, and 70,000 yards from the channel near the C.V. R. R. elevators, Ogdensburg Harbor, will be received at this office until 11:30 o'clock a.m., January 22nd, 1891. Attention is invited to the Acts of Congress approved February 26th, 1885, and February 23rd, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Detailnd information can be had on application. M.B.ADAMS, Major of Engineers. Jan. 1-8-21

UNITED STATES ENGINEER OFFICE, 34 West Congress Street, Detroit, Mich., November 28, 1890. Sealed proposals, in triplicate, for furnishing all materials and labor and building the masonry of a lock at St. Mary's Falls Canal, Michigan, will be received at this office until 2 o'clock p.m., January 27, 1891, and then publicly opened. Preference will be given to materials of domestic production or manufacture, conditions of quality and price (import duties included), being equal. Attention is invited to Acts of Congress, approved February 26, 1885, and February 23, 1887, vol. 23, page 332, and vol. 24, page 414, statutes at large. The government reserves the right to reject any or all proposals; also to award the contra t upon other considerations than the price. For further information apply at this office, or to the U. S. Engineer Office, Sault Ste. Marie, Mich. O. M. POE, Colonel, Corps of Engineers, Bvt. Brig.-Gen. U. S. A. J-22

UNITED STATES ENGINEER OFFICE, 34 West Congress street, Detroit, Mich., December 27, 1890. Sealed proposals, in triplicate, for furnishing all materials, plant, and labor, and excavating Hay Lake Channel, St. Mary's River, Mich., will be received at this office until 2 o'clock p. m., January 26, 1891, and then publicly opened: Preference will be given to plant and materials of domestic production or manufacture, conditions of quality and price (import duties included) being equal. Attention is invited to Acts of Congress, approved February 26, 1885, and February 23, 1887, vol. 23, page 332, and vol. 24, page 414, Statutes at Large. The government reserves the right to reject any or all proposals, and to waive any informalities in the bids received. For further information apply at this office, or at the United States Engineer Office, Sault Ste Marie, Mich. O. M. POE, Colonel Corps of Engineers, Bvt. Brigadier-General, U. S. A. J-22

PROPOSAL FOR HARBOR WORK, U. S. Engineer Office, Buffalo, N. Y. January 2, 1891. Sealed proposals, in duplicate, for the following harbor work, will be received at this office, until 2 p.m., on Monday, the 2d day of February, 1891, and opened immediately thereafter in presence of bidders: Improving harbor at Erie, Pa.; building and placing cribs and superstructure of about 450 feet extension of North Pier; improving harbor at Dunkirk, N.Y.; rebuilding superstructure of parts of the detached Breakwater and West Pier; building and placing one crib and building about 175 feet of superstructure of West Pier; improving harbor at Olcott, N.Y.; rebuilding parts of superstructure of piers. The attention of bidders is invited to Acts of Congress, of February 28, 1885, and February 23, 1887, Vol. 23, page 332, and Vol. 24, page 414, Statutes at Large. Preference will be given to articles of domestic production or manufacture, conditions of quality and price being equal. Specifications, general instructions to bidders, and blank forms of proposals will be furnished on application to this office. The United States reserves the right to reject any or all bids. AMOS STICKNEY, Major of Engineers, U. S. Army. Jan 8, 15, 22, 29

UNITED STATES ENGINEER OFFICE, 34 West Congress street, Detroit, Mich., December 20, 1890. To whom it may concern: Whereas, The navigation of the rapids of the St. Clair River, opposite Fort Gratiot, Mich., is obstructed and endangered by the wrecks of the schooners "M. E. Tremble" and "Ben Hur," Notice is hereby given to all persons interested in said vessels, their cargoes, and all other property therein, that if, within thirty (30) days from the date of this advertisement, they shall not have signified to me their intention and taken preliminary steps to remove said wrecks, etc., as soon as practicable, the same will be considered abandoned and derelict, and will be removed by the United States under authority of law. Sealed proposals, in triplicate, for the removal of said wrecks, etc., will be received at this office until 2 o'clock p.m., January 19, 1891, and then opened. Preference will be given to plant of domestic production or manufacture, conditions of quality and price (import duties included) being equal. Attention is invited to Acts of Congress, approved February 26, 1885, and February 23, 1887, vol. 23, page 332, and vol. 24, page 414, Statutes at Large. The government reserves the right to reject any or all proposals, and to waive any informalities. For further information, apply at this office. By authority of the Secretary of War. O. M. POE, Cononel of Engineers, Bvt. Brig. General, U. S. A. J-15

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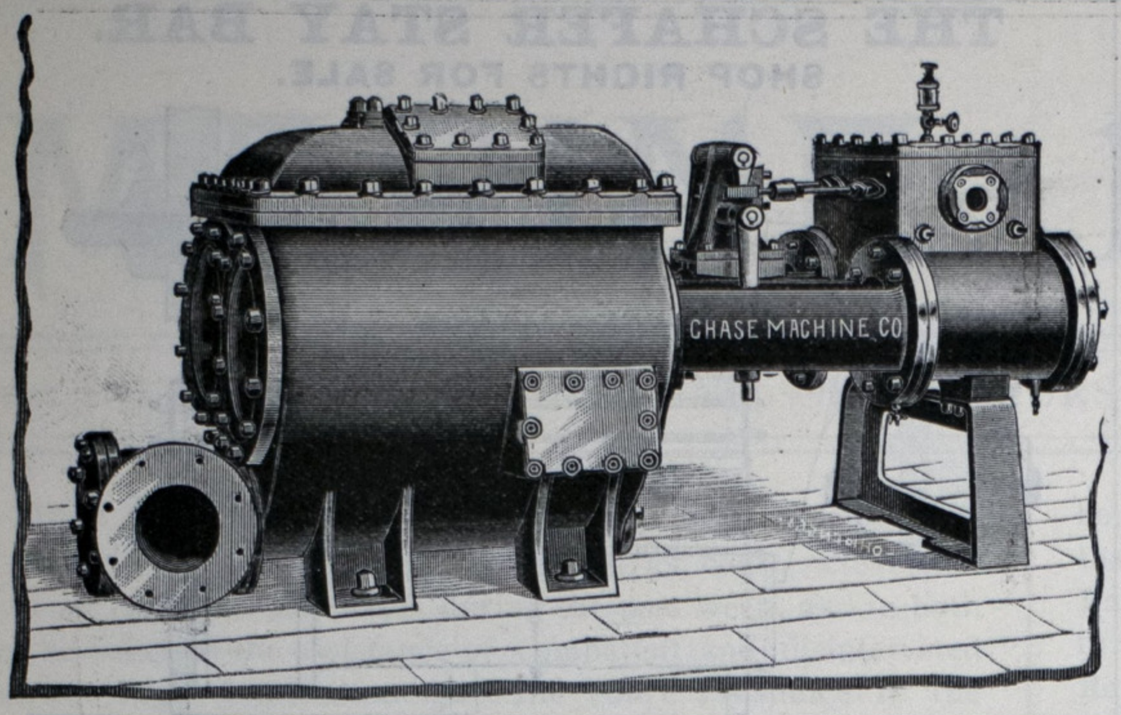

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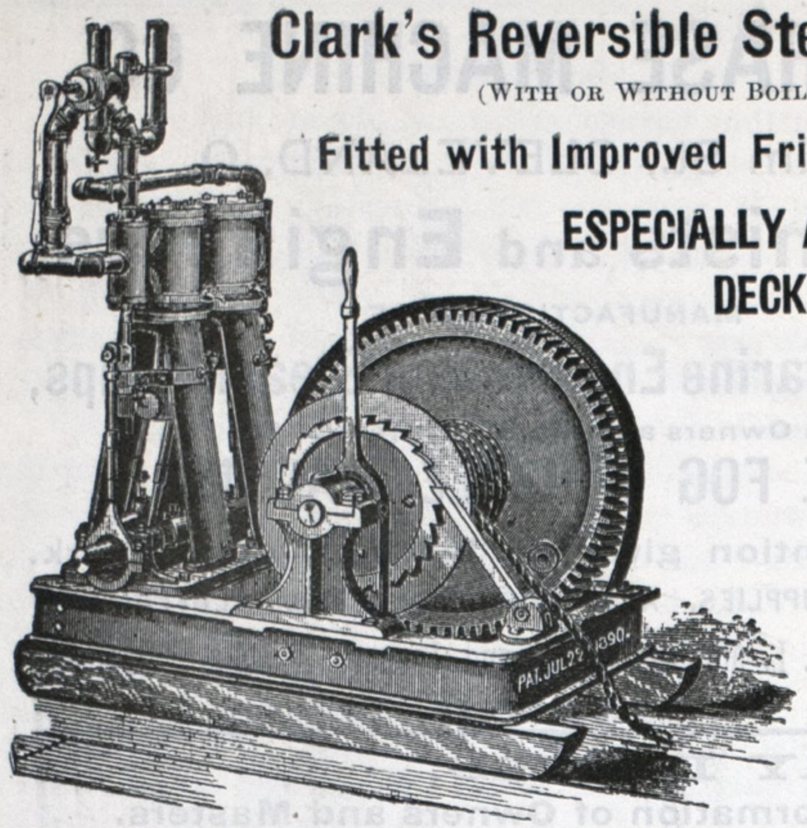

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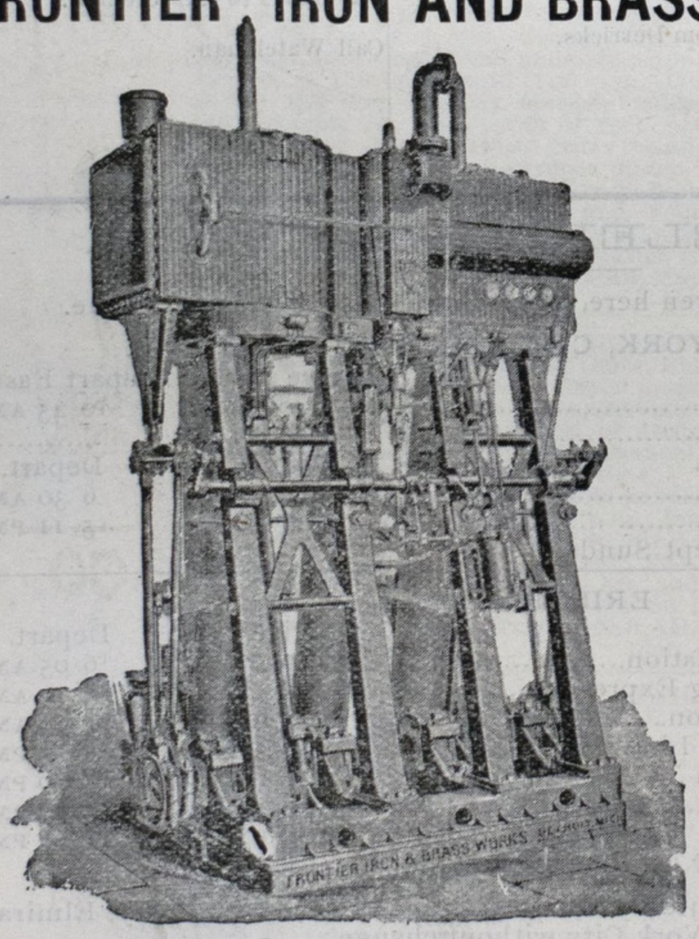

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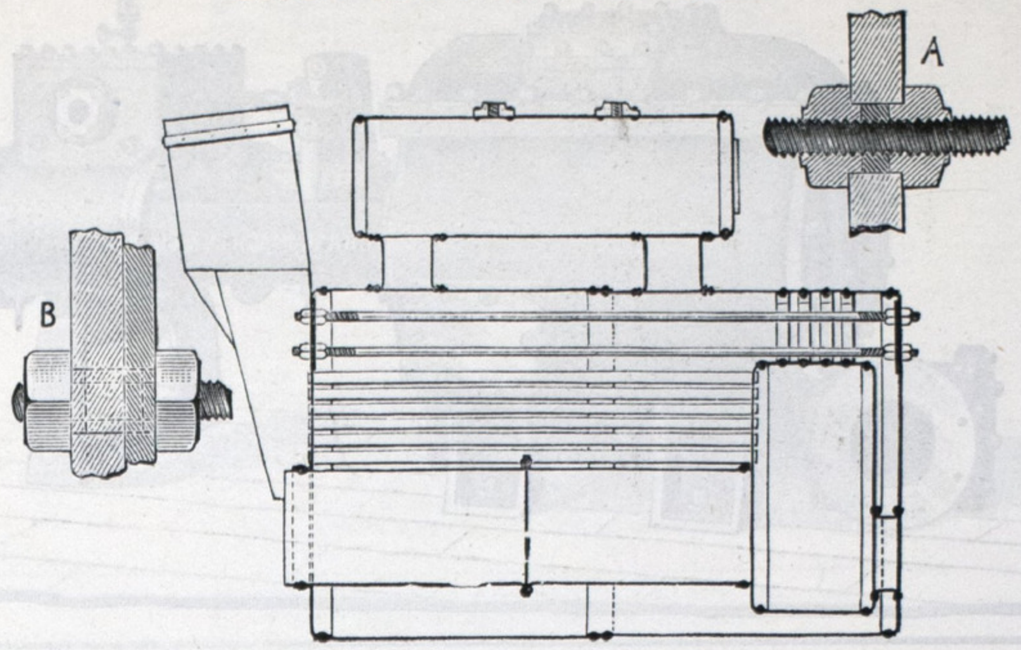

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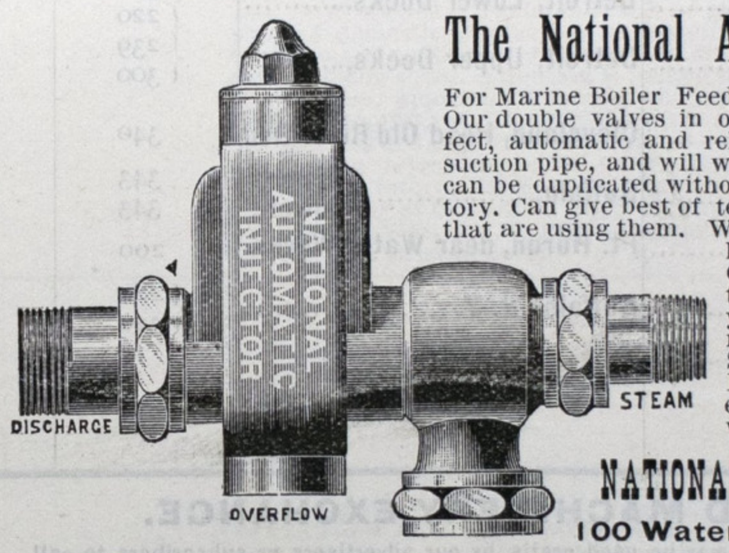

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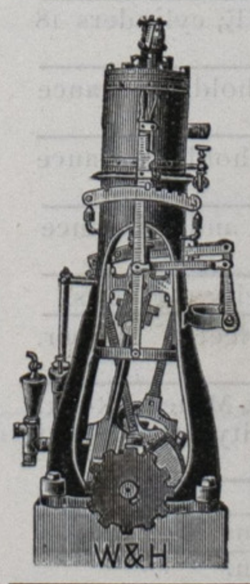

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